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First record of Marbled snake eel, *Ophichthus lithinus* (Jordan & Richardson 1908) (Ophichthidae: Anguilliformes) from Bangladesh marine water

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Abstract

The present paper reports the first record of marbled snake eel, *Ophichthus lithinus* (Jordan & Richardson, 1908) from Bangladesh marine water. The authors confirmed the identification of the species by the morphological characteristics of a single individual collected during the field survey conducted from November 2019 to March 2020 in Saint Martin's Island, Bangladesh. This paper also confirms the first occurrence of the genus *Ophichthus* Ahl, 1789 in the country.

Keywords: Bay of Bengal, Saint Martin's Island, Snake eel

Introduction

The family Ophichthidae is the most diverse family of the order Anguilliformes, commonly known as snake eels. The family is divided into two subfamilies e.g., Myrophinae (worm eels) and Ophichthinae (snake eels) (Nelson *et al.*, 2016; Hibino *et al.*, 2019). Currently, there are 354 recognized species worldwide where Myrophinae comprises 70 species and Ophichthinae with 284 species (Mohapatra *et al.*, 2018; Hibino *et al.*, 2019; Vo *et al.*, 2019; Sumod *et al.*, 2019; Fricke *et al.*, 2021) and inhabits in a wide variety of habitats from muddy estuaries to coral reefs (Smith & McCosker, 1999; McCosker, 2010)

The Ophichthids are rarely encountered in sampling because of their specialized burrowing nature (rapidly burrow into the substrate using the head or tail), nocturnal activity, and a specific habitat preference (McCosker & Rosenblatt, 1993; Castle & McCosker, 1999; McCosker, 2002). This is one reason why many species described only from a single specimen (Sumod *et al.*, 2019).

The genus *Ophichthus* Ahl, 1789 is the most speciose within the family Ophichthidae comprising more than 80 recognized species (Sumod *et al.*, 2019; Froese & Pauly, 2020). Species from the genus *Ophichthus* are inhabitants in different habitats ranging from estuaries to deep sea, most appearing in less than 200m (McCosker, 2010).

The Ophichthids is one of the least studied groups of fish in Bangladesh; reported only four species from the country (Hussain, 1970; Rahman *et al.*, 2009; Froese & Pauly, 2020, Habib *et al.*, 2020, Habib & Islam, 2020). However, no species was reported from the genus *Ophichthus* Ahl, 1789 in Bangladesh waters. In the present study we report *Ophichthus lithinus* species for the first time from Bangladesh water and confirm its new distribution area.

Methods

Sample collection and preservation: Single specimen of anguilli form eel species was collected from local fishermen of Saint Martin's Island (SMI) fished by hook and gill net set on the submerged rock and coral reef on 21st January 2020. The islandis located at the

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southern-most tip of Bangladesh in the Bay of Bengal approximately 13 kilometers south to an administrative unit, namely, Teknaf (Figure 1). The sample was deposited to Aquatic Bioresource Research Lab. (ABR Lab), Department of Fisheries Biology and Genetics, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh. Taxonomic identification of the speciemen and relevant measurements were followed by Smith and McCosker (1999), McCosker (2010), and McCosker and Psomadakis (2018).

Results

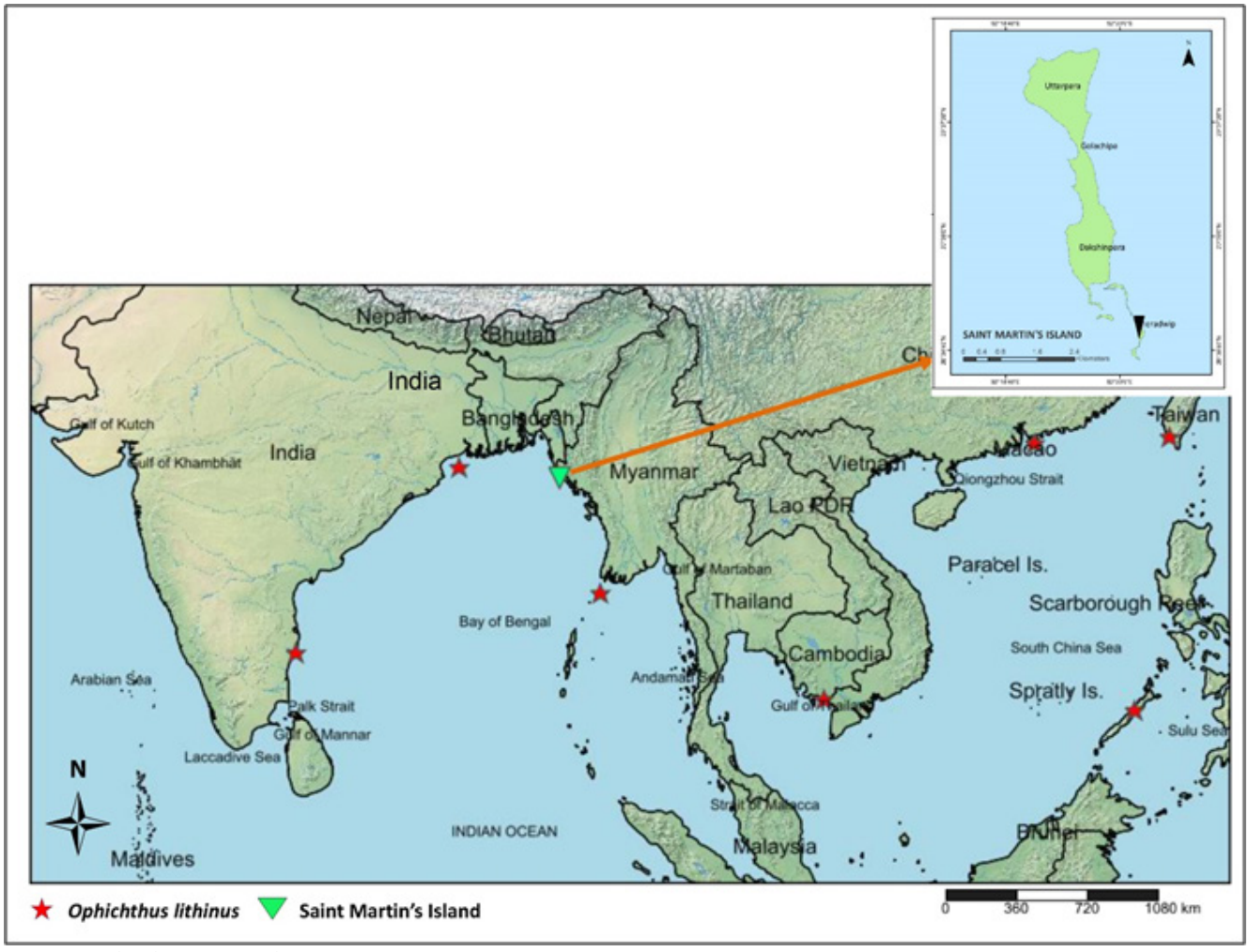
Taxonomic account of *Ophichthus lithinus* collected from Saint Martin's Island, Bangladesh is given herein:

Ophichthus lithinus (Jordan & Richardson, 1908)

Marbled snake eel [Fig. 2a, b & c]

Material examined: RF2001SM-1, 1 ex., 693 mm SL, Bangladesh: Cox's Bazar, Teknaf, Bay of Bengal, Saint Martin's Island (20°36'39.6"N, 92°19'37.2"E), 01.01.2020, R. Mia & S.R. Selim.

Description: Body and head brownish, a large dark spot at mid-head; dorsal part of body with brown irregular blotches, ventral part pale. A white rounded band presents behind the pectoral fin origin and gill opening. Fin pale. Body cylindrical, elongate, tapering and laterally compressed posteriorly. Snout and tail tip pointed, barbell present beneath mid-snout, anus at midbody. Maxilla reaching well behind eye, lower jaw shorter than upper jaw, pectoral fin



Map source: Shorthouse & David, 2010.

Figure 1. Sampling location of *Ophichthus lithinus* collected from St. Martin's Island of Bangladesh (▼) and nearest distribution of *Ophichthus lithinus* (★).

Table 1. Morphometric measurements (mm) of the collected speciemen of *Ophichthus lithinus* in the present study and compare with the previously reported specimens

	O. lithinus **(Present study)**	***O. lithinus*** **(Ray *et al.*, 2015)**
Total length	**693**	
Proportion in total length		
Body depth on dorsal fin origin	39.83	33.6
Body depth at pectoral fin origin	39.83	–
Body depth at anus	35.72	35.4
Head length	9.90	10–10.3
Trunk length	2.24	2.4–2.5
Lower jaw length	34.65	–
Upper jaw length	30.13	–
Pre dorsal length	8.06	8.6–8.8
Pre pectoral length	9.49	–
Preanal length	1.82	19–2
Dorsal-fin length	10.50	–
Pectoral-fin length	46.20	–
Proportion in Head length		
Eye length	10.00	11.2 (10.8)
Lower jaw length	3.50	3.8–4.1
Upper jaw length	3.04	2.9–3.1
Snout length	5.38	–
Interorbital space	7.37	7–7.3
Fin less area of tail region	14.00	14.3
Counts		
Dorsal fin ray	293	294–296
Pectoral-fin ray	11	11
Anal-fin ray	134	135–136

elongated but not pointed dorsal fin origins in the middle of the pectoral fin. Anterior nostril tubular and more or less half of eye diameter, head pore small, suborbital with 5 pores, infraorbital with 7 pores, lower jaw with 4 pores, preopercular with 3 pores, lateral line pores small and difficult to count completely. Teeth strong but short, conical and well separated from each other at base, anterior portion of maxilla with 6 teeth in rosette arrangement. Uniserial vomerine teeth in single row gradually decreasing in size, uniserial maxillary teeth and equal in size. Uniserial mandibular teeth, first one very small and others equal in size. Morphometric count and measurements of *O. lithinus* given into Table 1 and Figure 2a–c.

Discussion

Ophichthus lithinus was first described by Jordan and Richardson (1908) as *Leiuranus lithinus* Jordan and Richardson, 1908 based on of one specimen from Cuyo, Philippines. Jordan and Richardson (1909) were described *Ophichthu severmanni* based on two specimens from Kaohsiung, which was later treated as a junior synonym of *O. lithinus* (Hoese *et al.*, 2006; Ho & Shao, 2011).

The morphological counts, measurements and description of *O. lithinus* from SMI agree with the description of Ray *et al.* (2015). However, *Ophichthus*

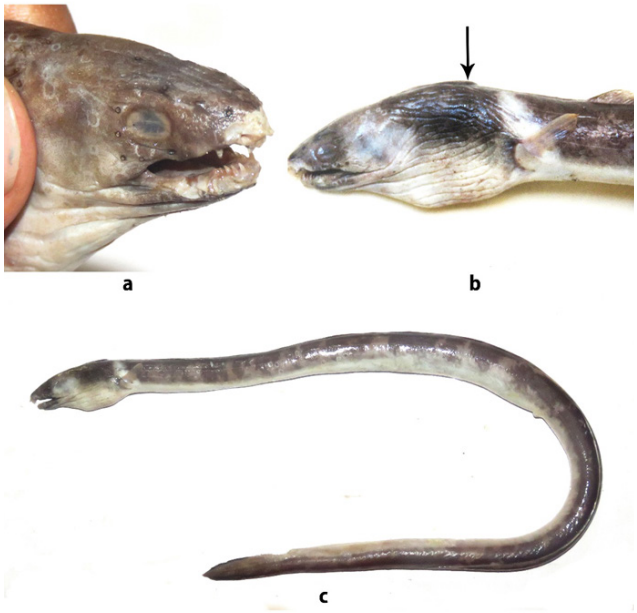


Figure 2. **a.** Jaw teeth of *Ophichthus lithinus*, **b.** Head of *O. lithinus,* and **c.** Lateral view of *O. lithinus* (SL. 693mm).

lithinus is distinguished from other similar species such as *Brachysomophis cirrocheilos* (Bleeker, 1857) in having lower jaw shorter than upper jaw vs. jaws are almost equal in size; cirri present in both the lips vs. cirri absent in lips.

The species also distinguished from its closely related species *Ophichthus cephalozona* (Bleeker, 1864) by having a smaller body depth of 24–30 in TL vs. larger body depth more than 35 in TL (Table 1) brown patches present on trunk and tail in *O. lithinus* vs. lacking in *O. cephalozona*.

Ophichthus lithinus is known to occurs from the Indo-Pacific to the Western Pacific waters through Australia, Philippines, Republic of Korea (Kim *et al.*, 2005), Taiwan (Hoese *et al.*, 2006), Southern Japan (Masuda *et al.*, 1984) Papua New Guinea (Kailola, 1987), Hong Kong (South China Sea) (Ni & Kwok, 1999), Vietnam (Nguyen & Nguyen, 1994), Myanmar (Ayeyarwady Delta) (McCosker & Psomadakis, 2018), India (Digha Coast and Tamil Nadu) (Ray *et al.*, 2015).

The nearest locations of the Saint Martin's Island of the Bay of Bengal from where the species *O. lithinus* were known to occur are Digha Coast of India. The current study confirms the presence of a new snake eel (*O. lithinus*) in Bangladesh and adds further prospects in rigorous study in the marine waters of the country.

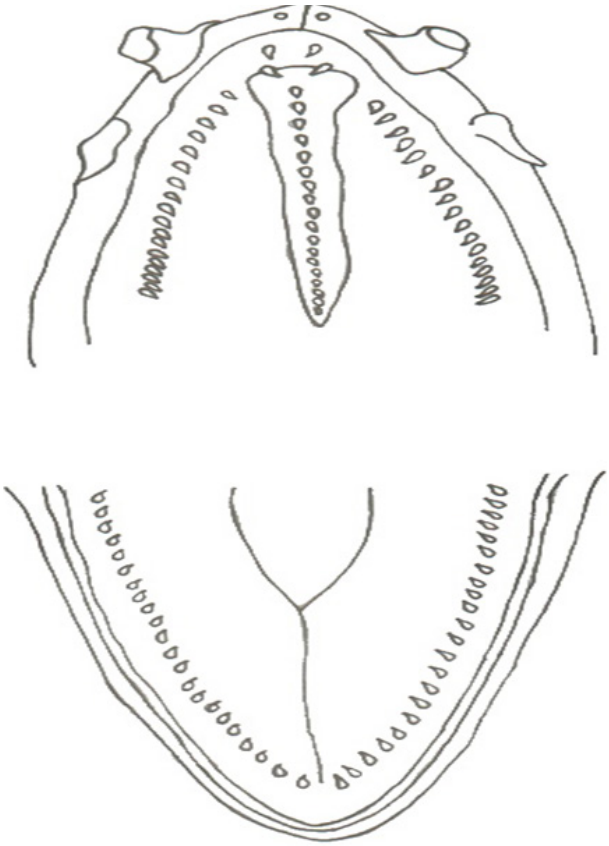


Figure 3. Dentition on upper jaw and lower jaw of snake eel, *Ophichthus lithinus*, from Saint Martin's Island, Bangladesh Bay of Bengal, India (SL. 693mm).

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Authors Contribution

MRM, MHR, and SRS collected the data; MRM and MJI analyzed the data and wrote the manuscript. Each of the authors reviewed and approved the manuscript.

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